Remarks

A. Basis for amendments to the claims

Claims 2 and 3 have been amended to change "component A" to --element A--. Basis for this amendment is independent claim 2 itself where independent claim 2 provides the following antecedent:

- A is at least one element selected from among cobalt, nickel, iron, lead, and bismuth.

Basis for the recitation in independent claim 2 to --at least one element selected from among cobalt, nickel, iron, lead and bismuth-- is also found in claim 2 and is further found in lines 21-25 on page 2 of the specification (paragraph [0012] of the published application).

B. The Office Action

B.1. Section 1 of the Office Action

In section 1 of the Office Action, it was noted that the Office Action is in response to applicant's communication of March 8, 2007 and that claims 2-4 are pending.

B.2. Section 2 of the Office Action

In section 2 of the Office Action, the information disclosure statements filed in the case were acknowledged.

B.3. Section 3 of the Office Action

In section 3 of the Office Action, claims 2 and 3 were rejected under 35 U.S.C. 112, first paragraph, because of 1) a scope of enablement issue; and 2) as failing to comply with the written description requirement. It was stated that applicant has not provided a discussion of any "component A" to support the claimed language.

Independent claim 2 provides the following antecedent:

- A is at least one element selected from among cobalt, nickel, iron, lead, and bismuth.

Independent claim 2 has been amended as follows:

wherein a supply source of ~~a component~~ said element A for preparing the catalyst is a composite of ~~the component~~ at least one element [[A]] selected from among cobalt, nickel, iron, lead and bismuth and at least one element selected from among molybdenum, vanadium, and copper.

Element A is, as indicated on lines 21-25 on page 2 of the specification (paragraph [0012] of the published application), at least one element selected from among cobalt, nickel, iron, lead, and bismuth.

Claim 3 has also been amended to recite --element A--.

It is therefore respectfully submitted that claims 2 and 3 comply with 35 U.S.C. 112, first paragraph, and corresponding enablement and written description requirements.

B.4. Section 4 of the Office Action

In section 4 of the Office Action, claims 2 and 3 were rejected under 35 U.S.C. 112, second paragraph. It was stated that applicant has not clearly stated what "component A" means.

"Component A" has been amended to --element A-- or --at least one element selected from among cobalt, nickel, iron, lead and bismuth-- in claims 2 and 3. As further indicated above, basis for this amendment is found in independent claim 2 and in the specification.

It is therefore respectfully submitted that claims 2 and 3 are now in compliance with 35 U.S.C. 112, second paragraph.

B.5. Sections 5-9 of the Office Action

In sections 5-9 of the Office Action, claims 2-4 were

rejected under 35 U.S.C. 103(a) as being unpatentable over Kawajiri et al. (US 5,719,318) in view of Brockwell et al. (US 6,492,548). This rejection is respectfully traversed on the basis of applicant's discussion immediately below.

C. Applicant's discussion

The claimed process is characterized by using, as the catalyst to produce acrylic acid, a catalyst prepared via a composite of at least one element selected from among cobalt, nickel, iron, lead and bismuth and at least one element selected from among molybdenum, vanadium, and copper (hereinafter this composite is referred to as "catalyst precursor"). Therefore, the claimed process has a prominent effect such that since, even under conditions where hot spots are formed, this catalyst is excellent in all of activity, selectivity, and catalyst life time and displays stable performances for a long time. Further, the claimed process using this catalyst can produce acrylic acid in a high yield for a long time. This is described in detail in the specification, for example, on page 2, paragraph 4; page 5, paragraph 3; page 13, paragraph 3.

This is also clear from comparisons of Examples with Comparative Examples as described in the specification. The Examples using catalysts prepared via the above catalyst precursor give better results than the Comparative Examples using catalysts prepared not via the above catalyst precursor. Specifically, for example, Example 6 is compared with Comparative Example 4 below. The procedures of these examples are the same as each other except for the catalysts used for the second reactor (reaction). As to the catalysts used for the second reactor (reaction), catalysts (1) and (6b) used in Example 6 have the same metal element compositions as catalysts (c1) and (c4) used in Comparative

Example 4. However, catalysts (1) and (6b) used in Example 6 are prepared via "Fe-Mo precursors" (Fe-Mo composite catalyst precursors) once obtained from ferric nitrate and ammonium paramolybdate which are simple compounds of Fe and Mo respectively, whereas catalysts (c1) and (c4) used in Comparative Example 4 are prepared not via the "Fe-Mo precursors" as catalyst precursors, but directly from ferric nitrate, ammonium paramolybdate and simple compounds of other elements. As shown in Table 1 below where the data are abstracted from the specification, Example 6 resulted in a higher acrylic acid yield and a longer catalyst life time than Comparative Example 4.

Table 1

	Source of Fe element as "element A"	Acrylic acid yield after 100 hours	Reaction duration at attainment to 300 °C
Example 6	Fe-Mo precursor	88 mol%	24,000 Hrs
Comparative Example 4	Ferric nitrate	85.8 mol%	13,000 Hrs

Reaction duration at attainment to 300 °C: the longer duration shows that the rise of the reaction temperature is smaller, so that the catalyst can be used for a longer time and is therefore a more economical and longer-life-time catalyst.

On the other hand, Kawajiri et al. and Brockwell et al. fail to disclose or suggest using a catalyst prepared via the above catalyst precursor (composite) as in the present invention, and as is positively claimed.

The catalyst as disclosed in Kawajiri et al. is not prepared via any catalyst precursor (composite), but is prepared directly from simple compounds of elements constituting the catalyst similarly to conventional catalyst production processes (column 2, lines 56-63 and Examples), which correspond to the Comparative Examples of the present invention.

In addition, Brockwell et al. only discloses using a commercially available product as the acrolein-to-acrylic acid catalyst (column 6, lines 63-65 and columns 9 and 10 (Examples)) and even does not disclose or suggest any catalyst production process. Therefore, the catalyst as disclosed in Brockwell et al. appears to also be produced by conventional catalyst production processes similarly to Kawajiri et al., that is, not via any catalyst precursor (composite).

Accordingly, both processes as disclosed in Kawajiri et al. and in Brockwell et al. (both corresponding to the Comparative Examples of the present invention) provide results inferior to those of the claimed process with regard to catalyst durability and acrylic acid yield.

The composition itself of the Mo-V catalyst used for production of acrylic acid was basically known to a person skilled in the art, and in fact, many patents disclosed similar compositions. Under such circumstances, there appears to have been patentability in how to prepare such a catalyst. Therefore, the claimed process could not have been led from the combination of both references which do not disclose using a catalyst prepared via the above catalyst precursor (composite).

D. Housekeeping matters

D.1. Period For Reply

A shortened statutory period for reply was set to expire three months from the mailing date of the Office Action of March 28, 2007. March 28, 2007 plus three months is June 28, 2007. This paper is being filed on or before Thursday, June 28, 2007.

D.2. Status

The Office Action of March 28, 2007 was nonfinal.

D.3. Disposition Of Claims

Claims 2-4 are pending.

D.4. Application Papers

This case includes no drawings.

D.5. Priority under 35 U.S.C. §§ 119 and 120

Acknowledgement of the claim for foreign priority was made in the Office Action dated March 28, 2007. This is appreciated.

Receipt of the certified copy of the priority document was acknowledged in the Office Action dated March 28, 2007. This is appreciated.

D.6. Attachments

Applicant has filed five PTO-1449 forms in this case, a first and second with the filing of this case on January 26, 2004, a third on August 4, 2004 (stamped as received on August 9, 2004), a fourth on April 11, 2006, and a fifth on October 15, 2006. All of the references on the PTO-1449 forms have been initialed, and all of the PTO-1449 forms have been signed and returned. Such is very much appreciated.

E. Summary

Applicant respectfully submits that the present application is now in condition for allowance. The Examiner is respectfully invited to make contact with the undersigned

by telephone if such would advance prosecution of this case.

Respectfully submitted,

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